

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P019369WO CMG	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/GB2004/004806	International filing date (day/month/year) 16/11/2004	(Earliest) Priority Date (day/month/year) 24/11/2003
Applicant UNIVERSITY OF SOUTHAMPTON		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

FABRICATION OF OPTICAL WAVEGUIDES IN PERIODICALLY POLED LITHIUM NIOBATE

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 2

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB2004/004806

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A method of fabricating an optical waveguide (18) comprises providing a sample of lithium niobate (10) that has one or more periodically poled gratings made by electric field poling, applying a patterned surface layer of metallic zinc (16) to a z-face of the sample so that the layer (16) has a pattern corresponding to an intended pattern of waveguides (18) to be written into the lithium niobate, and heating the sample to diffuse the metallic zinc (16) into the lithium niobate so as to form an optical waveguiding structure (18) within the sample.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>CANTELAR E, DI PAOLO R E, SANZ-GARCIA J A, PERNAS P L, NEVADO R, LIFANTE G, CUSSO F: "Second-harmonic generation in Zn-diffused periodically poled LiNbO3 channel waveguides" APPLIED PHYSICS B, vol. 73, 30 October 2001 (2001-10-30), pages 515-517, XP002318440 * sections "1. Introduction", "2. Experimental procedure", "3. Results and discussion" *</p>	1-7
Y	<p>BARRY I E ET AL: "Microstructuring of lithium niobate using differential etch-rate between inverted and non-inverted ferroelectric domains" MATERIALS LETTERS, NORTH HOLLAND PUBLISHING COMPANY, AMSTERDAM, NL, vol. 37, no. 4-5, November 1998 (1998-11), pages 246-254, XP004256024 ISSN: 0167-577X * section "2. Materials and methods" *</p>	1-7
Y	<p>TWU R-C ET AL: "ZN INDIFFUSION WAVEGUIDE POLARIZER ON A Y -CUT LINBO3 AT 1.32-MUM WAVELENGTH" IEEE PHOTONICS TECHNOLOGY LETTERS, IEEE INC. NEW YORK, US, vol. 12, no. 2, February 2000 (2000-02), pages 161-163, XP000912637 ISSN: 1041-1135 * section "II. Experiments" *</p>	1-7
Y	<p>SHIGEMATSU Y ET AL: "FABRICATION OF LINBO3 TE/TM WAVEGUIDES FOR 1.5 MUM WAVELENGTH BAND BY ZN/NI DIFFUSION IN LOW-PRESSURE ATMOSPHERE" JAPANESE JOURNAL OF APPLIED PHYSICS, PUBLICATION OFFICE JAPANESE JOURNAL OF APPLIED PHYSICS, TOKYO, JP, vol. 41, no. 7B, PART 1, July 2002 (2002-07), pages 4825-4827, XP001163083 ISSN: 0021-4922 * sections "1. Introduction", "2. Fabrication", figures 1-3, table 1 *</p> <p style="text-align: center;">----- -/-</p>	1-7

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SUHARA T ET AL: "FABRICATION OF ZN:LINBO3 WAVEGUIDES BY DIFFUSING ZNO IN LOW-PRESSURE ATMOSPHERE" JAPANESE JOURNAL OF APPLIED PHYSICS, PUBLICATION OFFICE JAPANESE JOURNAL OF APPLIED PHYSICS. TOKYO, JP, vol. 39, no. 8B, PART 2, 15 August 2000 (2000-08-15), pages L864-L865, XP000977869 ISSN: 0021-4922 * Introduction *	6,7
Y	YANG C ET AL: "Studies of photorefractive crystals of double-doped Ce,Fe:LiNbO3" OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 175, no. 1-3, February 2000 (2000-02), pages 247-252, XP004189588 ISSN: 0030-4018 abstract	6,7